Sept. 12, 1950 L. T. MEISTER 2,521,739

FUSE FOR BOMBS

Filed July 16, 1946

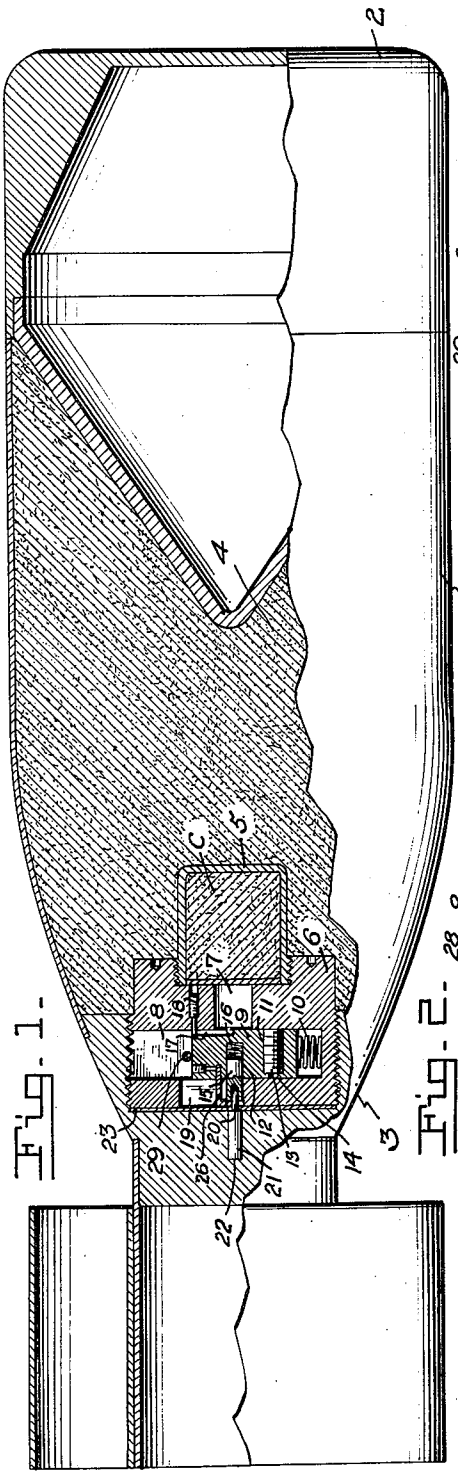


Fig. 1.

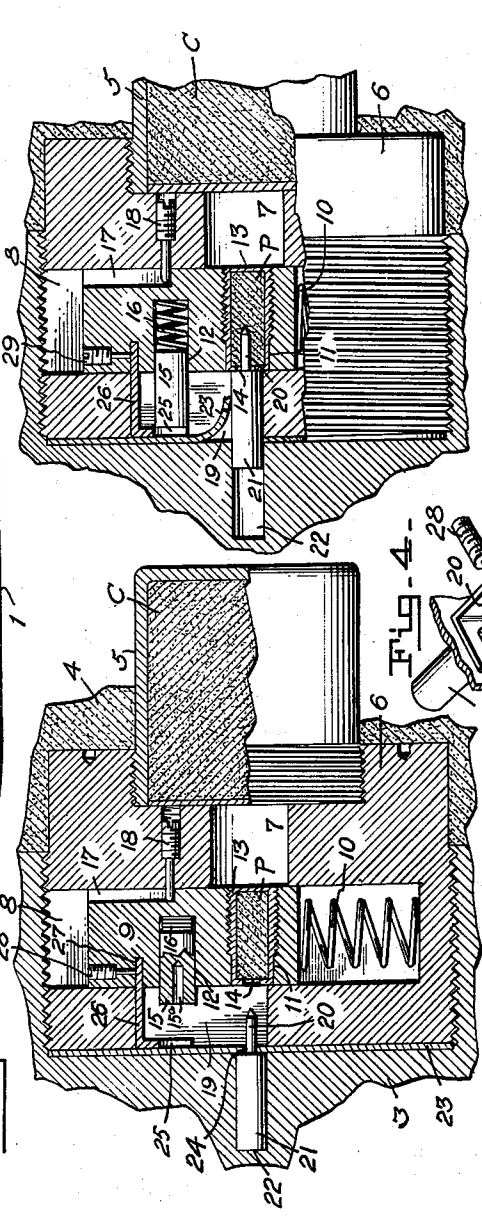


Fig. 2.

Fig. 3.

Fig. 4.

Inventor

Leo T. Meister

By J. H. Church & E. Thibodeau

Attorney

Patented Sept. 12, 1950 2,521,739

UNITED STATES PATENT OFFICE

2,521,739

FUSE FOR BOMBS

Leo T. Meister, Hillside, N. J.

Application July 16, 1946, Serial No. 683,966

6 Claims. (Cl. 102—78)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

1

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to a new and useful improvement in fuzes for bombs and is designed more particularly for use on aerial bombs for attacking submarines or other subaqueous targets. It is operative on a bomb which is subjected to an impact with the surface of the water and an impact with the target, the former impact arming the fuze and the latter impact causing the fuze to explode the bomb. The particularly novel feature of my improved fuze is the means provided for maintaining the fuze unarmed before and after it is dropped until its impact with the surface of the water, for arming the fuze by such impact while preventing exploding of the bomb by such impact, and for exploding the bomb by its impact on the target.

The structure and operation of the fuze of this invention is substantially equivalent to the fuze of my invention described and claimed in my copending application for Letters Patent entitled "Fuzes for Bombs," Serial Number 683,378, filed July 13, 1946. In this application, my invention relates to a mechanically detonated fuze, while my copending application aforesaid relates to an electrically detonated fuze.

While I have illustrated in the drawing filed herewith and have hereinafter fully described one specific embodiment of my invention, it is to be distinctly understood that I do not consider my invention to be limited to said specific embodiment, but refer for its scope to the claims appended hereto.

In the drawings:

Fig. 1 is a longitudinal vertical section, partly in elevation, of a bomb provided with my improved fuze, the parts being shown in unarmed position.

Fig. 2 is an enlarged fragmentary section, partly in elevation, showing the parts of the fuze in armed position.

Fig. 3 is an enlarged fragmentary section, partly in elevation, showing the parts in firing position.

Fig. 4 is a detail perspective of the yoke and bracket for the firing pin.

As illustrated in the drawing, my improved fuze is applied to a bomb intended for launching from a plane for attack on a submarine. The bomb has a charge-carrying head 1 with nose 2 and tail 3. A hollow-cone charge 4 is carried in head 1 and provided with booster charge C in

2

container 5 threaded into the forward end of body 6 threaded into tail 3 and extending forwardly into charge 4. The body 6 has an axial bore 7 extending rearwardly from container 5 to a transverse bore 8 in body 6. Slidable in bore 8, there is a block 9, urged upwardly in bore 8 by coil spring 10 seated in bottom of bore 8. Block 9 has two spaced bores 11 and 12 so positioned in block 9 as to be brought into axial alignment with bore 7, alternatively, by reciprocation of block 9. Bore 11 extends through block 9 and has threaded therein a container 13 for primer P with an axial bore 14 in its rear wall. Bore 12 extends into block 9 from its rear face and receives therein a bolt 15 urged rearwardly by coil spring 16 seated in forward end of bore 12. The block 9 has on its forward face a slot 17 extending downwardly from the top of block 9, in which is received a stop pin 18 threaded horizontally through body 6 from its forward face and acting to limit translation and to prevent rotation of the block. The body 6 has in its rear face a vertical slot 19 communicating forwardly with bore 8 and so disposed as to receive therein for vertical sliding movement the bolt 15 when it is extended from bore 12 by action of its spring 16. The slot 19 has its bottom in substantial alignment horizontally with the bottom edge of the container 13 for primer P. A firing pin 20 has its cylindrical body 21 slidable in bore 22 in tail 3 co-axial with bore 7. The rear face of body 6 is covered by a thin plate 23 of suitable metal such as aluminum. The pin 20 passes through an orifice 24 in plate 23 and the forward end of its body 21 is disposed against the rear face of plate 23. A yoke or fork 25 embraces pin 20 and has a bracket arm 26 received in a slot 27 in block 9 and is fastened therein by a set screw 28 threaded in block 3 from its upper face. A safety pin 29, passed through tail 3 and body 6 engages upper end of block 9 to hold it in unarmed position (Fig. 1).

The parts may be assembled in the following manner: Container 13 with primer P is placed in bore 11 of block 9 which is then placed in bore 8 and forced down to compress spring 10 placed below block 9 and held in this position as by a temporary pin through hole in body 6 provided for safety pin 29. Stop pin 18 is then mounted in body 6. Spring 16 and bolt 15 are passed through slot 19 in body 6 and seated in bore 12. Yoke 25 is then seated on block 9, its bracket 26 being fastened in slot 27 by set screw 28. Plate 23 is then applied to body 6, and firing pin 20 is passed through orifice 24 and yoke 25 to seat

in socket 15—*a* in bolt 15. The temporary pin is removed from body 6. Body 6, carrying its associated parts, is then passed rearwardly through head 1, its nose 2 being off, and threaded into tail 3, the body 21 of pin 20 being received in bore 22 of tail 3 and pin 29 is seated. Container 5 with booster charge C therein is threaded into body 6. The head 1 is charged with explosive charge 4 and nose 2 is placed on head 1.

When the bomb is about to be launched, the safety pin 29 is removed, and the fuze is maintained unarmed by pin 20 seated in bolt 15 preventing upward movement of block 9 so that the lead in train is interrupted.

When the bomb is dropped from the plane to attack the submarine, the force of its impact on the water is sufficient to cause the bolt 15 to move forwardly off of the firing pin 20 against the thrust of spring 16 to thereby release block 9 which is then projected upwardly by its spring 10, the parts assuming the position of Fig. 2, to arm the fuze.

It is to be particularly noted that the pin 20 is restrained from forward movement, on this first impact, by the plate 23 bearing against the body 21, and the yoke 25 which bears against the forward face of plate 23 surrounding pin 20. This is an important feature of my improved fuze, and it is obvious from Fig. 1 that I have provided means for holding the pin 20 at rest when the bomb makes the impact with the water. It will be noted (Fig. 4) that the yoke 25 embraces pin 20 snugly so as to bear against wall 23 surrounding pin 20 and bearing against body 21.

When the block 9 has been moved upwardly (Fig. 2), the yoke 25 is moved out of the path of pin 20 and that portion of wall 23 about orifice 24. Stop pin 18 checks the upward movement of block 9, when bore 11 carrying primer P is aligned with pin 20 and bore 7 leading to booster charge C, so that the lead in train is uninterrupted.

When the bomb strikes the submarine or other object in the water, the impact causes the pin 20 to move forwardly, its body 21 rupturing the wall 23, and the body 21 slides on bottom of slot 19, the pin 20 passing through orifice 14 of container 13 and striking primer P to detonate the bomb (Fig. 3).

Having described my invention what I claim is:

1. In a fuze for an aerial bomb, the combination of a slidable firing pin; a primer fired by percussion of said pin; a slide in which said primer is mounted; a bolt slidable in said slide for engagement with said pin for locking said slide in first position to interrupt the lead in train of the fuze, said bolt releasing said slide when moved out of engagement with the pin by a first impact of the bomb; means to immobilize the pin until after said first impact; and means to move said slide to second position, when released, to bring the primer to position relative to the pin so that the lead in train is uninterrupted, said immobilizing means being movable out of operative relation with respect to said pin in response to movement of said slide to said second position.

2. In a fuze for an aerial bomb for attacking a subaqueous target, the combination of a slidable firing pin; a primer fired by percussion of said pin; a slide in which said primer is mounted; a bolt slidable in said slide for engagement with said pin for locking said slide in position to interrupt the lead in train of the fuze, said bolt releasing said slide when moved out of engagement with the pin by impact of the bomb on the water; a frangible wafer having a portion engaging a portion of said pin; a fork carried by said slide and engaging said portion of said wafer to immobilize said pin on said impact; and means to move said slide, when released, to bring the primer to position relative to said pin so that the lead in train is uninterrupted, and to move said fork out of engagement with said wafer, said pin rupturing the portion of the wafer engaging the pin and sliding to fire the primer, on impact of the bomb on the target.

3. In a bomb fuze, the combination of a housing having an axial passage therethrough and a transverse bore intersecting said passage; an explosive charge at one end of said passage; a firing pin at the other end of said passage; a block slidable in said bore; a primer mounted in said block; a bolt slidable in said block and having an axial socket for receiving the pin therein; a spring for sliding said block; and a spring for sliding said bolt, the parts being so constructed and related that when the pin is received in the bolt socket, the block spring is tensioned, the block is positioned to hold the primer out of the passage, thus interrupting the lead in train, and the fuze is unarmed, and that when the fuze is subjected to impact the bolt moves off of the pin, thus releasing the block which is projected by its spring to bring the primer into the passage so that the lead in train is uninterrupted and the fuze is armed, and that when the fuze is subjected to a second impact the pin is driven into the primer to fire the explosive charge.

4. In a bomb fuze, the combination of a housing having an axial passage therethrough and a transverse bore intersecting said passage; an explosive charge at one end of said passage; a firing pin slidable in said passage; a block slidable in said bore; a primer mounted in said block; a bolt slidable in said block and having an axial socket for receiving the pin therein; a frangible wafer disposed in said passage; a fork carried by said block; a spring for sliding said block; and a spring for sliding said bolt, the parts being so constructed and related that, when the pin is received in the bolt socket, the block spring is tensioned, the block is positioned to hold the primer out of the passage, thus interrupting the lead in train, and the fuze is unarmed, that when the fuze is subjected to impact the bolt moves off the pin, thus releasing the block which is projected by its spring to bring the primer into the passage so that the lead in train is uninterrupted and the fuze is armed, and the pin is immobilized by the wafer and the fork when the the fuze is subjected to said impact, and the fork is moved by the projected block out of its position for immobilizing the pin, and that when the fuze is subjected to a second impact the pin ruptures the wafer, slides in said passage and detonates said primer which detonates said explosive charge.

5. A fuze comprising a body having mutually normal first and second intersecting bores therein, a firing pin slidably mounted in said body in alignment with said second bore, a primer, a block carrying said primer and slidable in said first bore between said second bore and said firing pin from a first position in which said primer is out of alignment with said second bore, to a second position in which said primer is aligned with said second bore and firing pin, means urging said block into said second position, re-

leasable means retaining said block in first position against the action of said urging means, said releasable means comprising a bolt slidable in said block and engaged by said firing pin, said bolt being slidable relatively to said block in response to a first impact of said fuze, to clear said firing pin and release said block for movement to said second position, and abutment means movable as a unit with said block and interposed in the path of movement of said firing pin to positively prevent movement thereof when said block is in said first position only.

6. A fuze comprising a body having mutually normal first and second intersecting bores therein, a firing pin slidably mounted in said body in alignment with said second bore, a primer, a block carrying said primer and slidable in said first bore between said second bore and said firing pin from a first position in which said primer is out of alignment with said second bore, to a second position in which said primer is aligned with said second bore and firing pin, means urging said block into said second position, releasable means retaining said block in first position against the action of said urging means, said releasable means comprising a bolt slidable in said block and engaged by said firing pin, said

bolt being slidable relatively to said block in response to a first impact of said fuze, to clear said firing pin and release said block for movement to said second position, abutment means movable as a unit with said block and interposed in the path of movement thereof when said block is in said first position only, said firing pin having an enlarged rearward end, said abutment means comprising a slotted abutment fitting over said pin and preventing movement of said enlarged end therethrough.

LEO T. MEISTER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,549,763	Greenwell	Aug. 13, 1925
1,550,977	Lukens	Aug. 25, 1925
2,358,403	Gore et al.	Sept. 19, 1944
2,405,840	Leech	Aug. 13, 1946

FOREIGN PATENTS

Number	Country	Date
257,335	Great Britain	Aug. 27, 1926